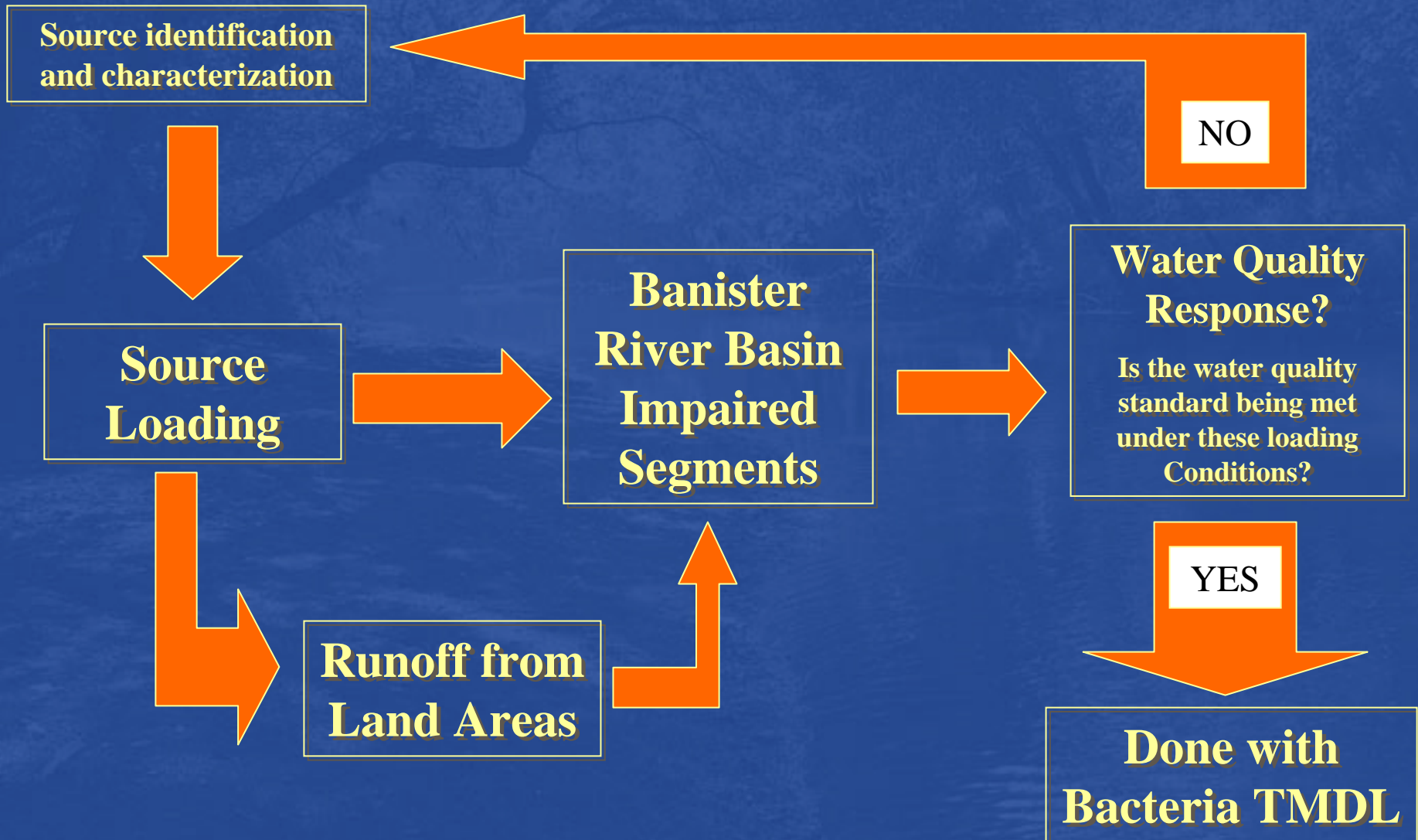
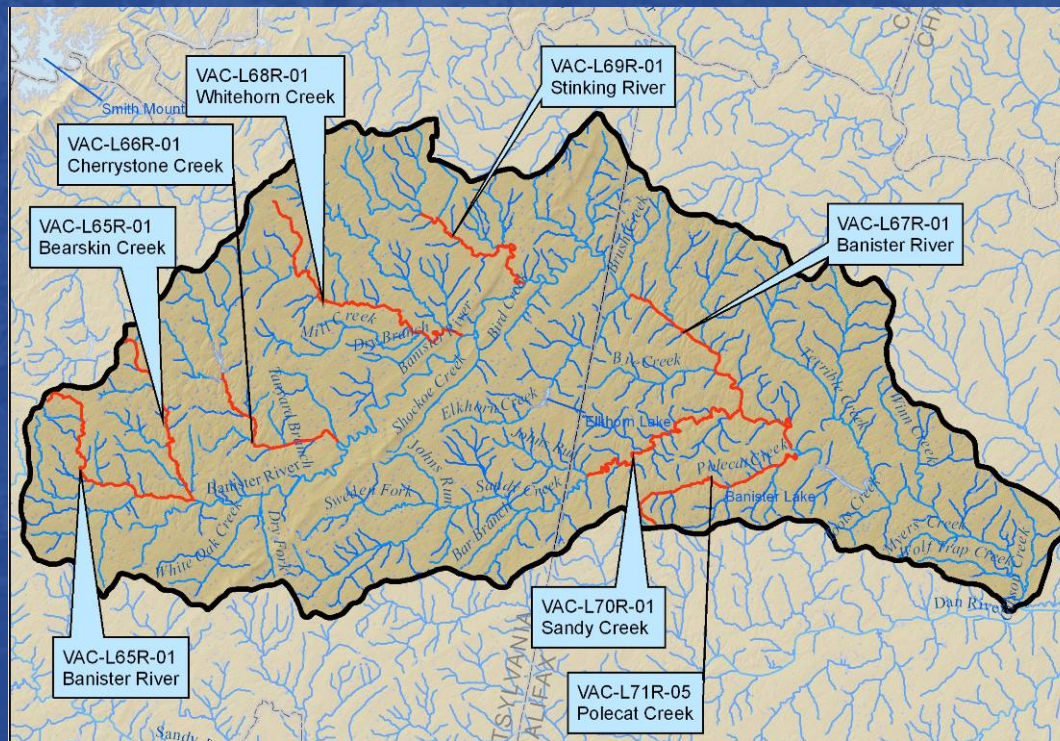


# Bacteria TMDL Development



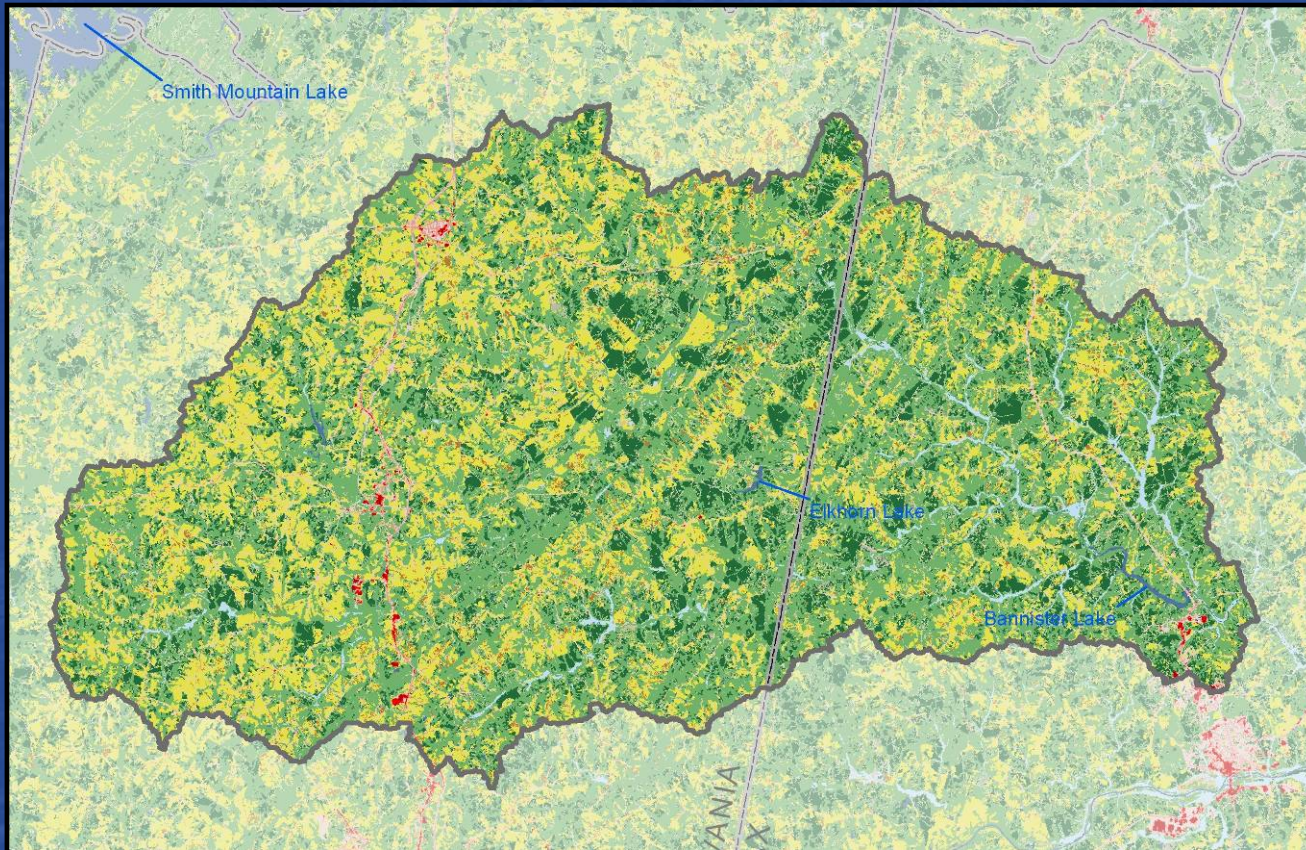
# Bacteria Impairments



TMDL ID	Stream Name	Miles	Impairment for	Violation Rate
VAC-L65R-01	Banister River	11.67	Total Fecal Coliform	2/18
VAC-L67R-01	Banister River	13.18	E. Coli	4/16
VAC-L65R-02	Bearskin Creek	9.31	E. coli	2/7
VAC-L66R-01	Cherrystone Creek	8.44	Total Fecal Coliform	1/8
VAC-L71R-05	Polecat Creek	9.66	Total Fecal Coliform	3/13
VAC-L70R-01	Sandy Creek	11.78	Total Fecal Coliform	3/19
VAC-L69R-01	Stinking River	8.99	Total Fecal Coliform	3/20
VAC-L68R-01	Whitehorn Creek	24.73	E. coli (2006), Total Fecal Coliform (2002)	E. coli - 2/8 Fecal Coliform 1/8



# Banister River Watershed Land Use



**Dominate Land Use  
Types:**

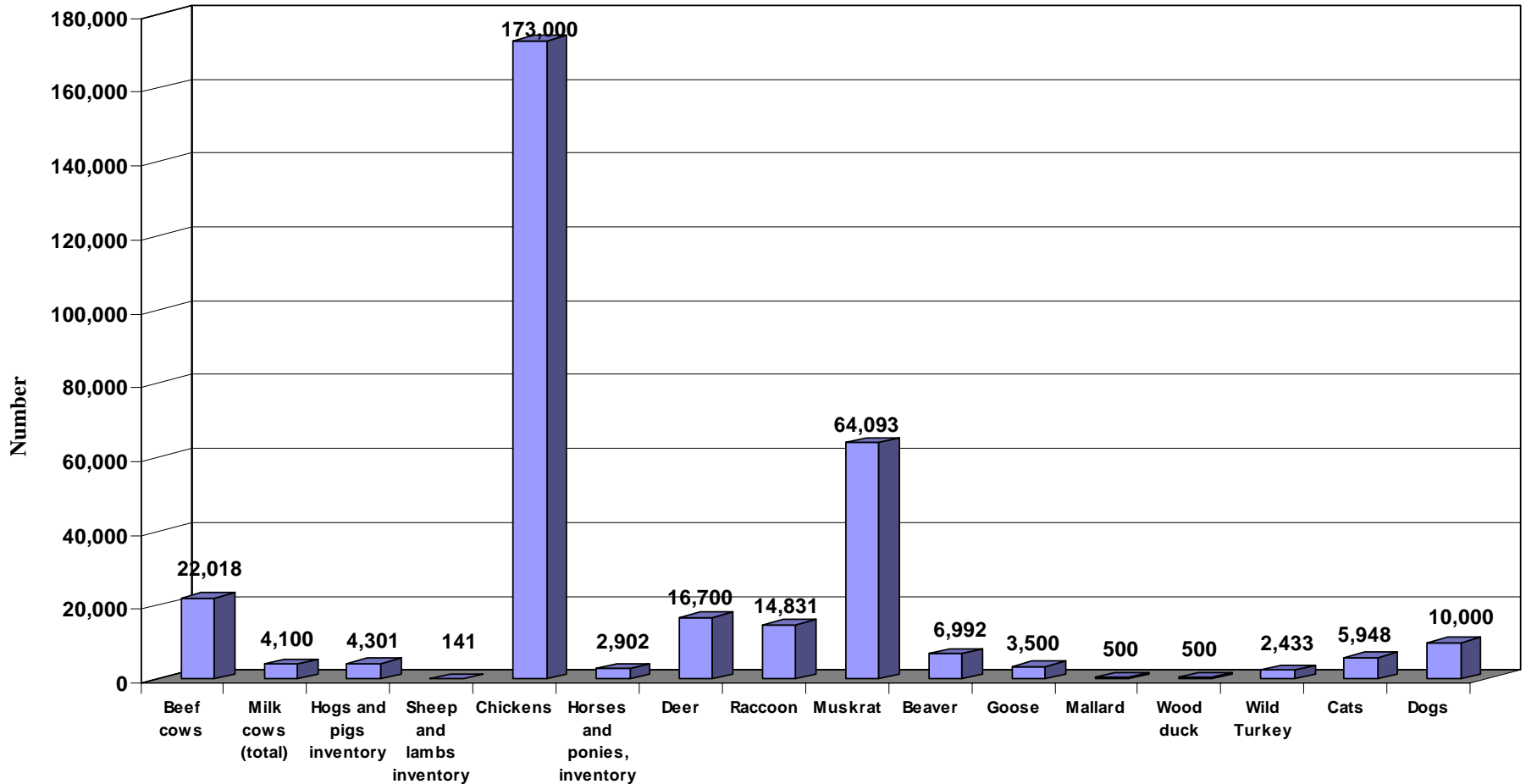
**Forest: 60%**

**Agricultural: 27%**

**Total Acres: 355,319**

# Bacteria Sources

## Animal Sources:



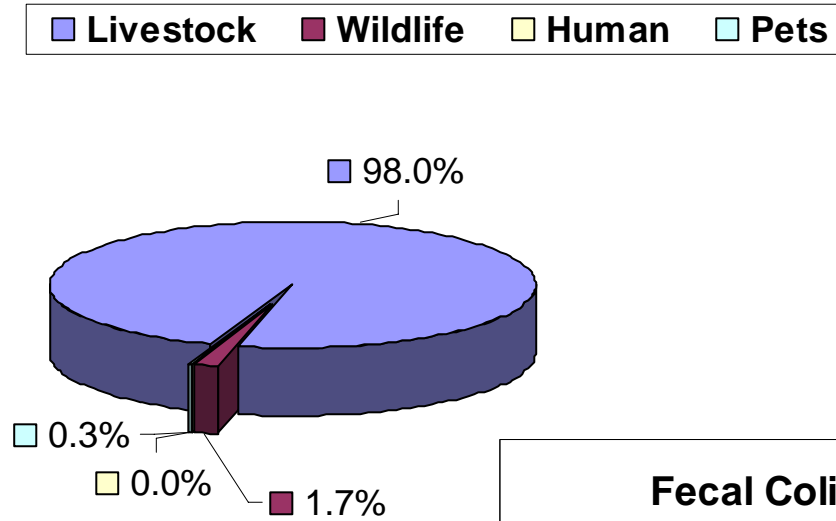
## Human Sources

Failing Septic: 25 households

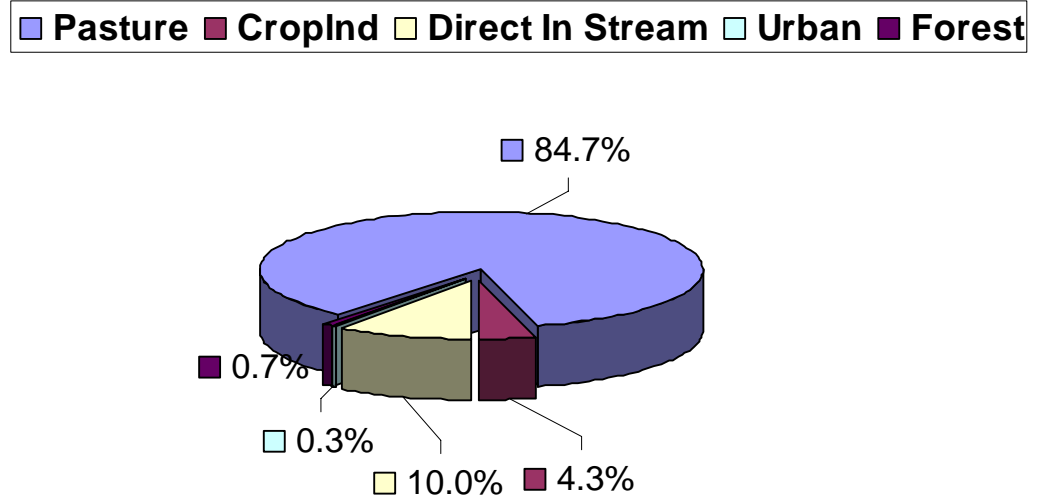
Straight Pipes: 19 households



## Fecal Coliform Total Available Daily Loading by Source



## Fecal Coliform Total Available Daily Loading by Land Use

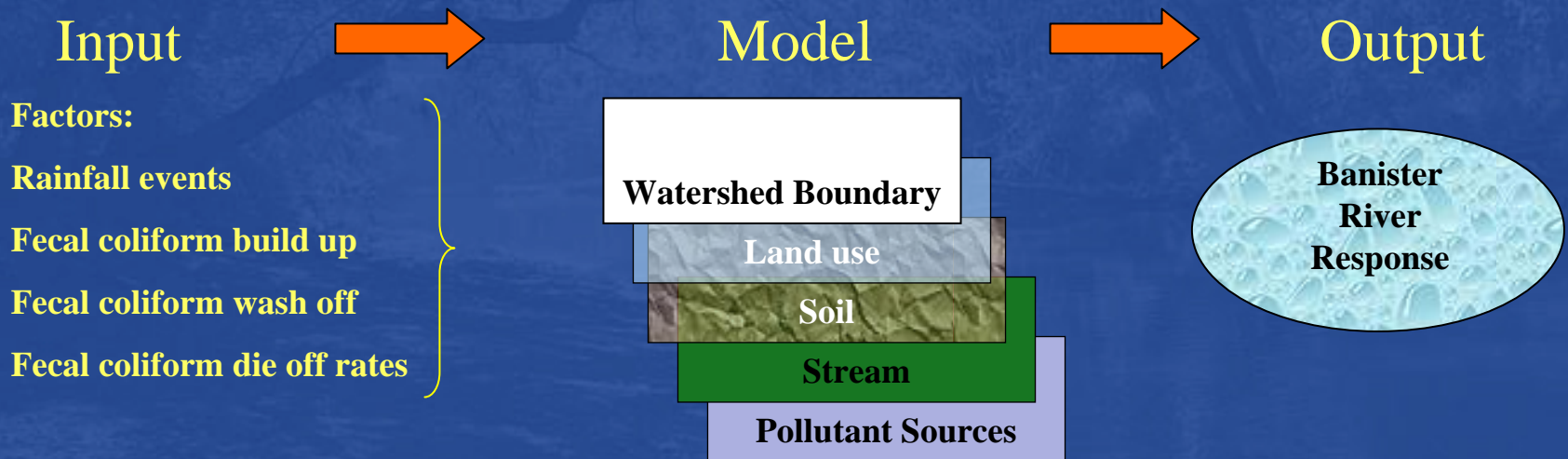


### Based On:

1. Number of each source
2. Land uses present
3. Time each source spends in each land use type

# HSPF Model

## Linking Sources to Water Quality

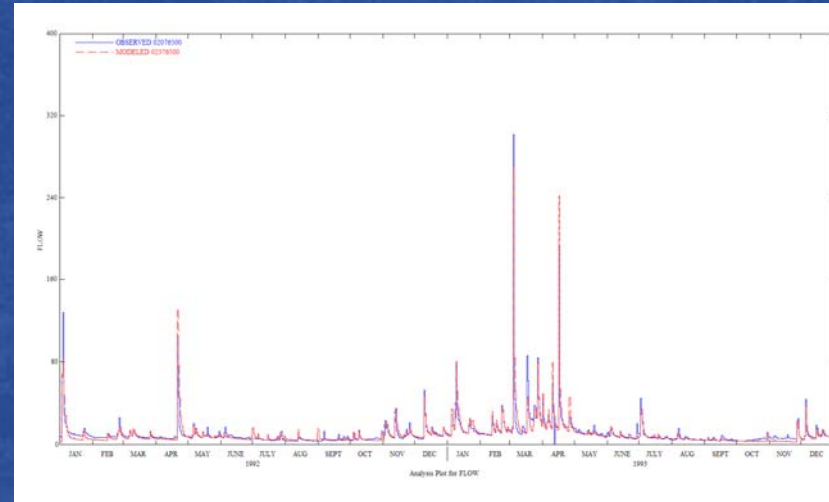


This is a state of the art model

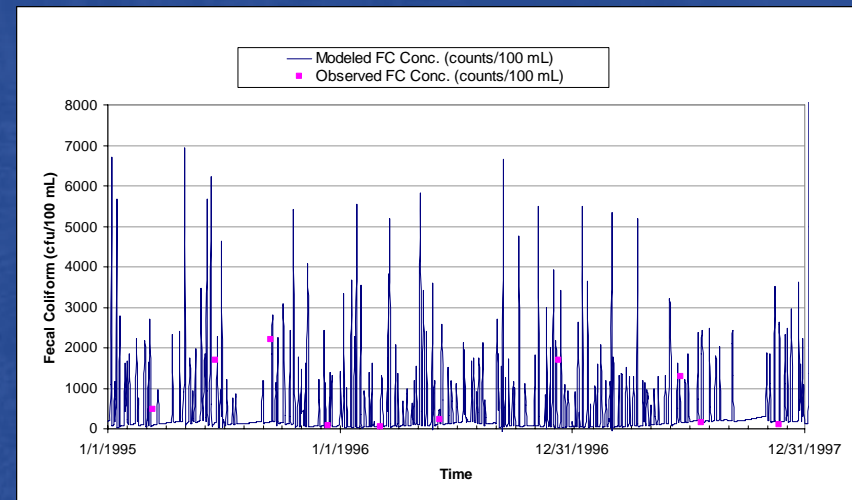
EPA approved for TMDL Development

# Bacteria Model Development

- **Model Setup-** Characterization, flow, and water quality data
- **Calibration-** Reality check of the model using the observed data
- **Validation-** Used to test the model response and applicability



Hydrology Calibration Results



Water Quality Calibration Results

# Overall (%) Reductions for Each Impaired Segment

Impaired Segment	Forest	Cropland	Pasture	Low Density Residential	Medium Density Residential	High Density Residential	Commercial/Industrial	Cattle- Direct Deposition	Wildlife- Direct Deposition	Failed Septics- Direct Deposition	Point Sources	Total Loads/ Overall Reductions
Banister River VAC-L67R-01	0	99.1	99.1	99.1	99.1	99.1	99.1	100	78	100	0	97.1
Banister Segment VAC-L65R-01	0	99.6	99.6	99.6	99.6	99.6	99.6	100	80	100	0	94.5
Stinking River VAC-L69R-01	0	99.3	99.3	99.3	99.3	99.3	99.3	100	75	100	0	93
Whitehorn Creek VAC-L68R-01	0	99.7	99.7	99.7	99.7	99.7	99.7	100	80	100	0	97.5
Cherrystone Creek VAC-L66R-01	0	99.6	99.6	99.6	99.6	99.6	99.6	100	80	100	0	97.5
Bearskin Creek VAC-L65R-02	0	99.3	99.3	99.3	99.3	99.3	99.3	100	80	100	0	94.6
Sandy Creek VAC-L70R-01	0	98.7	98.7	98.7	98.7	98.7	98.7	100	75	100	0	92.9
Polecat Creek VAC-L71R-05	0	99.3	99.3	99.3	99.3	99.3	99.3	100	80	100	0	91.5